



UNITED STATES  
 NUCLEAR REGULATORY COMMISSION  
 REGION II  
 101 MARIETTA STREET, N.W.  
 ATLANTA, GEORGIA 30323

Report Nos.: 50-259/92-37, 50-260/92-37, and 50-296/92-37.

Licensee: Tennessee Valley Authority  
 6N 38A Lookout Place  
 1101 Market Street  
 Chattanooga, TN 37402-2801

Docket Nos.: 50-259, 50-260,  
 and 50-296

License Nos.: DPR-33, DPR-52,  
 and DPR-68

Facility Name: Browns Ferry Units 1, 2, and 3

Inspection at Browns Ferry Site near Decatur, Alabama

Inspection Conducted: October 17 - November 13, 1992

Inspector: Paul J. Kellogg, Jr.  
 C. A. Patterson, Senior Resident Inspector

11/23/92  
 Date Signed

Accompanied by: W. Bearden, Resident Inspector  
 J. Munday, Resident Inspector

Approved by: Paul J. Kellogg  
 Paul J. Kellogg, Chief,  
 Reactor Projects, Section 4A  
 Division of Reactor Projects

11/23/92  
 Date Signed

SUMMARY

Scope: This routine resident inspection included surveillance observation, surveillance procedures and records, maintenance observation, operational safety verification, modifications, control of non-conforming materials, transfer of testing responsibility, Unit 3 restart activities, action on previous inspection findings, and self assessment.

One hour of backshift coverage was routinely worked during the work week. Deep backshift inspections were conducted on October 31 and November 4, 1992.



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Results: Unit 2 operated at power this period coasting down as normal fuel depletion occurred, paragraph five. Administrative speed limits remained in place for the recirculation pumps due to vibration concerns of small lines. Pre-outage work continued in preparation for the Unit 2 Cycle 6 outage scheduled for January 29, 1992.

A violation with five examples was identified by the NRC for failure to follow the fire protection plan procedure, paragraph five. Four examples were for not controlling transient material. The fifth example was for not having a fire watch in a spark producing area during welding activities. The licensee issued a site bulletin to all employees concerning these problems.

A violation was identified for failure to follow a surveillance instruction to verify a secondary containment isolation occurred, paragraph two. This coupled with redundant damper failures resulted in the potential for a radioactive release for over 13.5 hours. A large amount of debris in the ventilation duct may have been the reason one damper failed to close.

A violation was identified for a sleeping fire watch, paragraph, five. This was identified by the licensee. The fire watch was established because of inoperable thermo-lag. This is another example of a previous violation identified in Inspection Report 92-33.

An unresolved item was identified concerning non-performance of a quality control check point by a contractor inspector, paragraph ten. The inspector signed for an inspection performed, but it was not actually performed. The individual was removed from the site and a review of all work performed conducted.

An unresolved item was identified concerning altering of a procurement quality assurance record, paragraph ten. The licensee is tracking resolution of this issue with an administratively confidential significant corrective action report.

Unit 3 limited work activities continue with a major reassessment of engineering DCNs and modification WPs as the site moves to a single organization, paragraph nine.



## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees:

- O. Zeringue, Vice President, Browns Ferry Operations
- J. Scalice, Plant Manager
- J. Rupert, Engineering and Modifications Manager
- D. Nye, Recovery Manager
- \*M. Herrell, Operations Manager
- \*J. Maddox, Project Engineer
- \*M. Bajestani, Technical Support Manager
- R. Jones, Operations Superintendent
- \*A. Sorrell, Special Programs Manager
- C. Crane, Maintenance Manager
- G. Pierce, Regulatory Licensing Supervisor
- R. Baron, Site Quality Manager
- P. Salas, Compliance Supervisor
- \*J. Corey, Site Radiological Control Manager
- A. Brittain, Site Security Manager

Other licensee employees or contractors contacted included licensed reactor operators, auxiliary operators, craftsmen, technicians, and public safety officers; and quality assurance, design, and engineering personnel.

#### NRC Personnel:

- P. Kellogg, Section Chief
- \*C. Patterson, Senior Resident Inspector
- \*J. Munday, Resident Inspector
- W. Bearden, Resident Inspector

\*Attended exit interview

Acronyms and initialisms used throughout this report are listed in the last paragraph.

### 2. Surveillance Observation (61726)

The inspectors observed and/or reviewed the performance of required SIs. The inspections included reviews of the SIs for technical adequacy and conformance to TS, verification of test instrument calibration, observations of the conduct of testing, confirmation of proper removal from service and return to service of systems, and reviews of test data. The inspectors also verified that LCOs were met, testing was accomplished by qualified personnel, and the SIs were completed within the required frequency. The following SIs were reviewed during this reporting period:

- a. 2-SI-4.2.E.2FT, Drywell Leak Detection Radiation Monitor Detector Channel Functional Test 2-RM-90-256. This surveillance provides a functional test of the drywell leak detection air sampling system



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monitor 2-RM-90-256 by injecting a simulated high radiation signal and verifying proper response. This surveillance is performed monthly and partially satisfies requirements specified in TS Table 4.2.E. The inspector observed portions of the surveillance in progress on October 22, 1992, and reviewed the final documentation associated with the test. No deficiencies were noted.

- b. 2-SI-4.2.B-1(B), Core and Containment Cooling Systems Reactor Low Water Level Instrument Channel B Calibration. This surveillance checks the calibration of the core and containment cooling systems low reactor water level channel B. The test is performed once per six months and satisfies the calibration requirements of TS Tables 3.2.L and 4.2.L Reactor Low Water Level function and 3.2.F and 4.2:F Reactor Water Level function. The inspector observed portions of the test performed on October 26, 1992. The inspector verified the equipment used was within its calibration due date and that it was the proper equipment required by the test. The technicians exercised good communication between personnel performing verifications at other locations in the plant. The procedure was reviewed by the inspector and found it to be clear and contained adequate detail for the intended users. No deficiencies were noted during the performance of this surveillance.

- c. Unit 3 Reactor/Refueling Zone Isolation Failure

On October 27, 1992, while performing SI 3-SI-4.2.A-10, Reactor Building and Refueling Floor Ventilation Radiation Monitor Calibration and Functional Test, the Unit 3 reactor zone inboard and outboard exhaust dampers failed to close in response to a containment isolation test signal. The refueling zone supply fan 3B also failed to trip.

At 12:28 a.m., step 7.5 of the SI was performed which initiates all three trains of SBT, CREV trains A and B, isolation of Unit 3 reactor zone, isolation of the refueling zone, and Unit 3 group VI isolation. Step 7.5.2 verifies these actions have occurred. At 2:00 p.m., the operator discovered by damper position indication that the inboard reactor zone exhaust isolation damper, 3-FCO-64-42, had failed to completely close and the outboard reactor zone exhaust isolation damper, 3-FCO-64-43, was full open. These two failures resulted in the Unit 3 reactor zone being unisolable for 13.5 hours. It was also noticed that the refueling zone supply fan 3B had failed to trip. LCO 0-92-137 was entered due to the failed dampers, and by 3:30 p.m., the Unit 3 reactor zone was isolated. Incident Investigation II-B-92-072 was initiated to document the event. A four-hour report was made to the NRC at 5:50 p.m., as required per 10CFR50.72(b)(2)(iii)(C).

Maintenance inspected the inboard damper and finding no obvious abnormalities operated the damper successfully. The binding could not be duplicated. They did however note that the duct housing



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the damper contained debris consisting of a leather glove, a squashed cardboard box, a ball of tape, an empty caulking tube, a strip of foam, and dirt. It is suspected the damper became bound by a piece of this debris that subsequently became dislodged and allowed it to operate normally. The outboard damper was found to have a bad solenoid and air regulator. It was also noted that two of the damper blades were bent. It has not been determined how or when this occurred. The 3B supply fan control circuit had a relay stuck in the energized position which went to the de-energized state when tapped. Further inspection revealed a piece of lancing cord in the relay plunger. Following its removal the relay operated normally.

The original design of the secondary containment was to have a Unit 1 reactor zone, a Unit 2 reactor zone, and a Unit 3 reactor zone, each being completely isolable from the others and to have a common refueling zone, also isolable from the other zones. Due to seismic concerns and excessive leaks between zone boundaries, the plant is unable to establish this "zonal integrity". The secondary containment is collectively considered to include Units 1, 2, and 3, reactor zones as well as the refueling zone with communication between each. Therefore, a breach in one zone is effectively a breach all zones. Consequently, the failure of the Unit 3 reactor zone inboard and outboard dampers to close resulted in a loss of secondary containment integrity. Verification that the isolation had occurred was performed by observing indicating light ZI-64-123 on panel 3-9-25, being lit. Although the light is labelled REACTOR ZONE ISOLATED it does not supply adequate verification of isolation and in fact only serves to verify the isolation signal was generated. Although damper position and fan indicating lights are also located on panel 3-9-25, they were not verified. Failure to properly perform step 7.5.2.4, which required verification of Unit 3 reactor zone isolation, resulted in this loss going undetected for approximately 13.5 hours. Discussion at the Plant Evaluation Review Panel meeting on November 6, 1992, indicated that the operator performing this step was recently licensed and may not have been aware that the Reactor Zone Isolated light only provided verification that the isolation signal had been generated. This event constitutes a failure to follow procedure as required by TS 6.8.1, Procedures, and is identified as VIO 259, 260, 296/92-37-01, Failure to Verify Secondary Containment Isolation.

One violation was identified in the Surveillance Observation area.



### 3. Surveillance Procedures and Records (61700)

The inspector reviewed the following completed SI's in accordance with Inspection Procedure 61700:

2-SI-4.3.B.3.a	revision 8
2-SI-2.1	revision 6
2-SI-4.6.E.1	revision 7
2-SI-4.5.A.1.c(I)	revision 10
2-SI-4.6.A.1	revision 1
2-SI-4.6.A.6 & 7	revision 7

The procedures were technically adequate, contained the appropriate reviews and approvals, and verified compliance with TS and the inservice inspection program. The test performers were verified to be qualified for the tasks performed. One discrepancy noted by the inspector was the surveillance instruction review form did not include the names of all the performers who had initialed steps in the body of the procedure. This was discussed with licensee management. The inspector will followup on this discrepancy as well as perform further review of SI's in a subsequent inspection. No further discrepancies were noted by the inspector.

### 4. Maintenance Observation (62703)

Plant maintenance activities were observed and/or reviewed for selected safety-related systems and components to ascertain that they were conducted in accordance with requirements. The following items were considered during these reviews: LCOs maintained, use of approved procedures, functional testing and/or calibrations were performed prior to returning components or systems to service, QC records maintained, activities accomplished by qualified personnel, use of properly certified parts and materials, proper use of clearance procedures, and implementation of radiological controls as required.

Work documentation (MR, WR, and WO) were reviewed to determine the status of outstanding jobs and to assure that priority was assigned to safety-related equipment maintenance which might affect plant safety. The inspectors observed the following maintenance activities during this reporting period:

#### a. Master Feedwater Level Controller

On October 19, 1992, reactor water level perturbations of two to five inches were observed on several occasions. Reactor water level controller, 2-LIC-046-0005, was taken to manual and the level returned to normal. Operations placed two of three reactor feed pumps in manual to prevent them from over or underfilling the reactor due to an erroneous signal from the controller. A replacement controller was energized and allowed to warm prior to its installation. On October 21, 1992 the inspector observed maintenance personnel replacing the controller. The inspector



reviewed the controlling work order, 92-57929-02, and found it contained adequate instruction for the job performed. Following replacement, the controller was observed and reactor water level varied to ensure proper operation. Later, the controller was observed to respond sluggishly during a planned power reduction. It was determined that the controller needed adjusting but rather than doing this with the unit at power it was decided to simply change out this controller with a new one. The data obtained from the installed controller was used to adjust the new one. The controller was replaced on November 5, 1992, with no adverse effects. The inspector found no deficiencies with this activity.

b. 2DA LPCI MG Set

An inspector observed various activities associated with the 2DA LPCI MG Set. The MG Set was removed from service at 5:00 a.m., on October 22, 1992, and returned to service at 5:30 p.m., the same day. LCO 2-92-378-3.9.B.13 was written to track the maintenance and return to service. The inspector reviewed WO 92-60117-00 which provided instruction for applying the proper amount and type of grease to the flywheel bearings and coupling. Activities observed were in accordance with the WO. Calibrated tools used for the job displayed current calibration stickers and were appropriate for the intended work. The inspector did not identify any problems with this maintenance activity.

c. 2A Drywell Air Compressor

On October 20, 1992, an inspector observed performance of portions of O-TI-53, Drywell Control Air Compressor Capacity Test, following maintenance on the 2A air compressor. The inspector reviewed WO 92-61086-00 which controlled the maintenance activities and included rebuilding and replacing this air compressor with a spare. The compressor was disassembled and showed signs of having run excessively hot. Additionally water was found in the oil. Following re-assembly of the spare compressor O-TI-53 was satisfactorily performed as a post maintenance test. The inspector verified the proper equipment was used and setup properly. The technicians performing the test were qualified and followed the procedure satisfactorily. The inspector did not identify any problems with this maintenance activity.

No violations or deviations were identified in the Maintenance Observation area.

5. Operational Safety Verification (71707)

The NRC inspectors followed the overall plant status and any significant safety matters related to plant operations. Daily discussions were held with plant management and various members of the plant operating staff.

The inspectors made routine visits to the control rooms. Inspection observations included instrument readings, setpoints and recordings, status of operating systems, status and alignments of emergency standby systems, verification of onsite and offsite power supplies, emergency power sources available for automatic operation, the purpose of temporary tags on equipment controls and switches, annunciator alarm status, adherence to procedures, adherence to LCOs, nuclear instruments operability, temporary alterations in effect, daily journals and logs, stack monitor recorder traces, and control room manning. This inspection activity also included numerous informal discussions with operators and supervisors.

General plant tours were conducted. Portions of the turbine buildings, each reactor building, and general plant areas were visited. Observations included valve position and system alignment, snubber and hanger conditions, containment isolation alignments, instrument readings, housekeeping, power supply and breaker alignments, radiation and contaminated area controls, tag controls on equipment, work activities in progress, and radiological protection controls. Informal discussions were held with selected plant personnel in their functional areas during these tours.

a. Unit Status

Unit 2 remained at power and was on-line for 44 days at 85 percent power at the end of the period. The unit was coasting down in power as normal fuel depletion occurred. Administrative limits remained in place on the recirculation pump speed due to vibration concerns discussed in IR 92-33.

b. Fire Protection Program Implementation

1.) Transient Combustible Control

The inspector reviewed the licensee's Fire Protection Program specifically in the area of transient combustibles as outlined in Fire Protection Program Plan, FPP-2, Attachment C. Within this area several weaknesses were identified which collectively resulted in an inadequate implementation of the program for control of transient combustibles.

On four separate occasions the inspector observed activities that did not comply with requirements established by FPP-2. The examples are stated below:

- a.) On September 15, 1992, the inspector observed painting in the DG Building that was being controlled under transient combustible permit 92-0252 that had not been inspected nor signed since September 10, 1992. Daily inspections are required if work is in progress.



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- b.) The inspector again observed painting in the Diesel Generator Building on October 13, 1992, that was being controlled by transient combustible permit 92-0304. The area had not been inspected nor the permit signed since October 8, 1992. Further the permit expired October 13, 1992, but was still in place October 14, 1992.
- c.) On October 16, 1992, the inspector observed a four foot by eight foot sheet of untreated plywood in Diesel Generator Room 1A. There was no transient combustible permit posted nor had Fire Protection Engineering approved its use.
- d.) On October 22, 1992, a large storage box and two sawhorses made of untreated plywood were observed within the protected area but were not controlled by a transient combustible permit.

Failure to adequately control transient combustibles is a violation of TS 6.8.1.1.f requiring procedures to be established, implemented, and maintained covering implementation of the fire protection program. Fire Protection Program Plan, FPP-2, Attachment C implements portions of this requirement as it relates to transient combustibles. This constitutes four examples of VIO 259, 260, 296/92-37-02, Fire Protection Procedure Adherence Problems.

Following discussion with licensee management, on October 28, 1992, the fire protection group issued a site newsletter that stated these findings and discussed how these problems could be prevented.

2.) No Fire Watch in Spark-Producing Area

During a routine tour of the turbine building on October 21, 1992, the inspector observed sparks and slag from welding coming underneath the new east access door into the turbine building. No fire watch was visible in the area. The unit operator was contacted and the work was stopped. This was discussed with operations supervision on October 21, 1992. The inspector reviewed the fire protection program plan, FPP-2, Fire Protection Attachments, and determined that the procedure requirements were not followed for a fire watch for "hot work" activities. "Hot work" activities encompass all torch cutting, welding, open-flame, grinding, and spark-producing operations. FPP-2, procedure step 5.3.4 requires a continuous fire watch when hot work is performed in the plant areas and that the fire watch remain in the immediate



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work area for 30 minutes after the completion of all "hot work". Accordingly, this is the fifth example of VIO 259, 260, 296/92-37-02, Fire Protection Procedure Adherence Problems.

c. RMS-9 Trip Devices

As part of a review of circuit breaker coordination problems the licensee made a 10 CFR Part 21 Notification. This concerned RMS-9 circuit breaker trip devices with instantaneous trip adjustment. This was part of a previous item IFI 92-30-03, Circuit Breaker Coordination. To prevent spurious trips, a time delay of 300 microseconds was designed into the trip device. However, subsequent testing demonstrated that the device will trip in 100 microseconds.

The licensee stated that six of GE AC circuit breakers with RMS-9 trip devices had been installed in the 480 volt distribution systems for Units 1 and 3. The operability of the installed circuit breakers had been evaluated and determined to have no adverse effect on Unit 2 operation. Twenty-three trip devices were in the warehouse. The inspector requested to review the plant records to determine the location of RMS-9 trip devices. For several days the licensee was unable to produce records to indicate the location of all devices. On November 12, 1992, the licensee provided records for review. These will be reviewed in the next report period to determine if all RMS-9 trip devices have been located.

d. Recirculation Pump Speed Problems

The licensee continues to experience problems with the recirculation pump speed. On November 2, 1992, the 2B experienced a speed fluctuation. Initially the control was placed in manual and the MG scoop tube locked in place. After installation of monitoring equipment on the speed controller, the scoop tube was unlocked and the controller returned to normal. The licensee continues to evaluate the cause of the speed fluctuation.

Additionally, both recirculation pump speeds have been limited to 1500 rpm due to vibration concerns. This was discussed in detail in IR 92-33. The licensee is also reviewing upgrades of the system for the Unit 2 cycle 6 outage and possible replacement of the MG sets for Unit 3 restart with a solid state system capable of varying pump speed.

e. Inattentive Firewatch

On November 11, 1992, at approximately 9:40 a.m., a Technical Support Supervisor observed a fire watch who was inattentive to duty and appeared to be sleeping. The fire watch, located in Unit 3 reactor building, 621 ft. elevation, was established as



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compensatory action under LCO 3-92-129-3.11.G due to inoperable fire wrap.

The fire watch supervisor was informed and the fire watch was replaced. The fire watch supervisor informed Operations and plant management. A licensee event report is being written by Site Licensing.

TS 3.11.G.1.a requires that with one of the required fire-rated sealing devices inoperable, within one hour establish a continuous fire watch on at least one side of the sealing device. Additionally, FPP-2, Fire Protection Program, Attachment L, requires that a fire watch shall be on continuous alert for fire, signs of fire, and/or any act that might result in a fire. In IR 92-33, the inspector documented VIO 260/92-33-03, when on October 2, 1992 a fire watch was found inattentive to duty and asleep. Accordingly, this example although identified by the licensee is another example of the violation contained in IR 92-33 and is identified as VIO 259, 260, 296/92-37-03, Fire Watch Inattentive to Duties.

Two violations were identified in the Operational Safety Verification area.

6. Modifications (37700, 37828)

Unit 2 cycle 6 pre-outage work continued in preparation for the scheduled January 29, 1993 outage. The following activities were working:

- integrated computer system
- evacuation alarm upgrades
- control bay HVAC
- DG battery replacement
- CRDR Unit 2 and Unit 3 Control Rooms
- Fire Detection Upgrades

The inspector routinely monitored these activities during plant tours and attendance at POD meetings. Fire protection plan procedure adherence problems were identified and discussed in this IR.

7. Control of Non-conforming Materials (35747)

During the previous reporting period an inspector identified a potential example of the licensee's failure to mark and segregate non-conforming material from the general material storage area in the warehouse at Browns Ferry. During a tour of the warehouse performed on September 17, 1992, the inspector noted that several large boxes of Thermo-lag Fire Barrier Material were stored on shelves with no marking to designate that the material was not acceptable or that any limits might exist for its use. A member of management from the Site Procurement Organization accompanied the inspector on this tour and was not aware of any problem associated with the material. This concern was discussed with the



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licensee and URI 259, 260, 296/92-33-03 was opened pending further review by the inspector.

During the inspector's review of this issue the inspector noted that NRC Bulletin No. 92-01 dated June 24, 1992, described a problem with this material and further stated that the NRC considered that the material did not provide the level of safety required by NRC requirements. Additionally the inspector noted that the licensee's POD has routinely listed a statement that Thermo-lag 330 is inadequate protection. This statement has been included under the Plant Operating Status Section of the POD and has been openly discussed during daily POD meetings. Tested Thermo-lag installations did not meet the 1 Hr and 3 Hr requirements for fire barriers. The Thermo-lag material itself may or may not be non-conforming depending upon further testing. In either case it should be controlled in a manner that allows its traceability to be maintained until its final disposition is determined.

On October 28, 1992, the inspector returned to the warehouse for a general tour and to inspect the licensee's segregated storage area for non-conforming materials. The inspector noted that the above questionable material was not stored in the segregated storage area but was still located in the original storage location as noted during the last inspection period. The inspector was informed that the licensee's existing procedures allowed non-conforming materials to not be segregated if not practical as long as the material was marked as non-conforming. Although some of the boxes of thermo-lag material were marked with yellow hold tags not all of the boxes were marked. The inspector reviewed SSP-10.2, Material Receipt and Inspection, and determined that this practice was allowed by section 3.6.C.

Additionally during this more recent tour the inspector observed that the licensee was locating and removing many GE RMS-9 Trip Device Kits from storage due to a problem documented in a 10 CFR Part 21 report. This Part 21 Report had been submitted by TVA on October 27, 1992. The inspector was informed by the Warehouse Supervisor during this tour that the trip device kits would be placed in segregated storage.

The inspector met with members of the Site Quality Organization for determining the extent of oversight in this area. During the discussion the inspector was provided copies of QA Audits and QA Monitoring reports which represented QA reviews of the materials area. Although the reviews appeared extensive and thorough they did not specifically address non-conforming materials. The inspector was informed that non-conforming materials was an area that had been considered during these reviews but no problems had been found by the licensee. The inspector determined that the only recent problem in this area had been identified by the licensee on August 26, 1992. This problem was documented in SCAR BFSCA 9200018 and identified the failure to prevent issuance of non-conforming material. This problem was associated with a damaged piece of 2" X 2" X 3/16" angle steel that was identified as damaged (bent) during receipt inspection. The material was labeled by Bechtel personnel with a hold tag but not placed in segregated storage because



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contractor personnel were not aware of the existence of a controlled non-conforming materials yard. The hold tag was then inadvertently lost and the material was issued for use. The inspector was informed that the damaged portion of the steel had probably been cut out in the field and not used. This SCAR is still open with review of corrective actions by the MRC pending.

Based on the above review the inspector determined that the licensee had complied the requirements for control of non-conforming material. URI 259, 260, 296/92-33-03 is closed based upon this review.

#### 8. Transfer of Testing Responsibility

The licensee has been recently undergoing a change in the responsibility of performance of various types of testing from the Technical Support Staff to the Maintenance and Radcon Sections. The testing being transferred includes leak rate testing, hydrostatic testing, vibration analysis, HVAC flow measurements, and other tests in support of SIs and TIs. Until recently this testing responsibility was performed by personnel that reported directly to the Technical Support staff with an assigned cognizant engineer for each type of test.

An inspector reviewed the status of transition of these responsibilities to determine the adequacy of any interim licensee controls that might be needed during this transition period. The inspector determined that although the transition is still ongoing (not all training has been completed) the actual responsibility has been transferred. However no actual testing has occurred without adequate measures first being taken to ensure that test personnel were qualified. The licensee has identified the various tasks that will be assigned to maintenance and radcon personnel. Training of personnel to perform those tests has been identified and some training has occurred in some areas. Within the maintenance section various tasks have been assigned to specific maintenance crews. These crews have been scheduled for training. The inspector was informed that craft personnel from each crew must attend training prior to the first scheduled performance of each particular test. Additionally the Technical Support engineer that had cognizant responsibility prior to the transition would participate in the first performance of each test. The inspector reviewed selected training from a summary list of training completed in this area. That training included several classes conducted onsite by outside contractors in the area of Controltron flow measurement, Computational Systems Incorporated Vibration Analysis, Environmental Engineering Consultants training on HVAC air flow measurements, and leak rate testing training conducted by the corporate maintenance organization. This training had been conducted for maintenance craft personnel that are designated to perform the associated testing.

Based on this review the inspector determined that the licensee's controls which cover this transition of responsibilities appears to be adequate. The inspectors will continue to follow licensee activities in this area.



## 9. Unit 3 Restart Activities (30702)

The inspector reviewed and observed the licensee's activities involved with the Unit 3 restart. This included reviews of procedures, post-job activities, and completed field work; observation of pre-job field work, in-progress field work, and QA/QC activities; attendance at restart craft level, progress meetings, restart program meetings, and management meetings; and periodic discussions with both TVA and contractor personnel, skilled craftsmen, supervisors, managers and executives.

Major activities in work were the following:

- condenser retubing
- drywell steel modifications
- weld overlays
- RWCU system piping
- RVLIS modifications
- CSST tap changer modification
- cooling tower repair
- CCW pump and motor refurbishment

A major reassessment and review of all engineering and modification DCNs and WPs continued as the site transition to a single organization. The engineering work was estimated to be 30 to 40 percent complete compared to a previous estimate of 70 to 80 percent.

- a. The inspector observed a portion of the installed modification to relocate the reactor water level reference leg outside the drywell. This installation was performed under DCN W17463 RA. The DCA W17463-02 was compared to the actual installation. The valve orientation, various piping dimensions, and bend orientation were checked. No problems were identified.
- b. Cooling Tower Refurbishment

The inspector reviewed the status of the refurbishment of cooling towers 1, 5, and 6. The present schedule indicates a phase 1 SPOC walkdown on November 24, 1992. Essential to completion of this was the resolution of moisture entry in the cooling tower fan motors. Each tower has 16 fan motors. Several motors were refurbished and reinstalled but later tested unsatisfactory following a megger test. The licensee initial resolution of this problem focused on redesign of the motor shaft seal as the motors are vertically installed. Further testing determined that moisture still entered the motors with the redesigned seal.

Additional testing was performed and determined that if the fan motor heaters remain energized when the fans are not operating then moisture accumulation is not a problem. All 16 motors were tested after operating the motor heater for 72 hours on each of the three towers. Only two motors failed indicating a possible insulation defect that must be resolved. It was concluded that if



the motors are left exposed to the elements they act as sponges, heating up during the day and sucking in moist night air. Also, with the temperature change from night to day condensation can occur on the outer stator winding surface. Recommendations for resolution of the problem were to keep the fan motor heater in operation when the fan motors were not operating. Other preventative maintenance checks were also recommended to ensure the heaters remain in an operable state.

c. CRDR

The CRDR field work activities were temporarily stopped following management reorganization of Units 1 and 3. During this time work plans and processes were rewritten/reformatted to conform with those written to support Unit 2 activities. Previously written work plans were formatted differently than those written to support Unit 2 activities and as such added a point of confusion to those working with both. The licensee intends to use the same format for all work plans. After the work plans were reformatted CRDR work resumed.

10. Action on Previous Inspection Findings (92701, 92702)

a. (CLOSED) URI 259, 260, 296/91-24-03, Rosemount Transmitter Failures.

This item was opened for resolution of the failures and SI test method. The inspector reviewed the licensee's closure package for this item. The failures were attributed to metallic particles in the sensing cell fill fluid. This was determined by Rosemount and an independent laboratory. A manufacturing process problem prior to 1986 was the cause of this. These transmitters were model 1153DD7. The licensee replaced 18 transmitters in the plant. These were used in the main steam line high flow and HPCI steam line high flow transmitters. The licensee evaluated each of the failures at the time of occurrence and determined the minimum number of sensors per trip system were operable. No TS violation had occurred. The licensee reviewed this for 10 CFR Part 21 requirements and determined this was not reportable.

The vendor manual was reviewed and the zero static pressure shift is an optional item for calibration of the transmitter. The error associated with this shift has been included in the setpoint calculation for these transmitters; and this step was not required.

The inspector concluded each of these issues had been addressed. The failures occurred during the power ascension test program following Unit 2 restart, and were corrected, and no other problems have occurred.



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- b. (CLOSED) URI 259, 260, 296/92-33-03, Control of Nonconforming Materials. This URI is addressed in paragraph 7 of this report.

11. Self Assessment (40500)

- a. Non-performance of QC Checkpoint

The inspector was informed on November 9, 1992, by the site quality manager of a nonconformance report issued by GE concerning a QC inspector signing a QC checkpoint without actually performing the work. The contractor report stated all other work performed by the individual was reviewed and no detrimental affect to quality was identified. The inspector was removed from the site pending disciplinary action. The site quality organization issued their own finding identification reporting, BFFIR 920148, to track resolution of the issue. This item is identified as URI 92-37-04, Nonperformance of QC Checkpoint, pending resolution of the issue.

- b. Altering of Procurement QA Record.

The inspector reviewed SCAR BFNSCA920019, concerning an altered procurement record. This concerns the cut and splicing of two QA records to produce a third. The licensee is investigating this issue and details of the SCAR are being treated as administratively confidential. This will be tracked as URI 259, 260, 296/92-37-05, Altering of Procurement QA Records.

12. Exit Interview (30703)

The inspection scope and findings were summarized on November 13, 1992, with those persons indicated in paragraph 1 above. The inspectors described the areas inspected and discussed in detail the inspection findings listed below. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors during this inspection. Dissenting comments were not received from the licensee.

<u>Item Number</u>	<u>Description and Reference</u>
259, 260, 296/92-37-01	VIO, Failure to Verify Secondary Containment Isolation, paragraph two.
259, 260, 296/92-37-02	VIO, Fire Protection Procedure Adherence Problems, paragraph five.
259, 260, 296/92-37-03	VIO, Inattentive Fire Watch, paragraph five.
259, 260, 296/92-37-04	URI, Nonperformance of QC checkpoint, paragraph eleven.



259, 260, 296/92-37-05

URI, Altering of Procurement QA Record,  
paragraph eleven.

Licensee management was informed that 2 URIs were closed.

## 13. Acronyms and Initialisms

BFFIR	Browns Ferry Finding Identification Report
CFR	Code of Federal Regulations
CRDR	Control Room Design Review
CREV	Control Room Emergency Ventilation
DCA	Design Change Authorization
DCN	Design Change Notice
DG	Diesel Generator
FPP	Fire Protection Plan
GE	General Electric
HPCI	High Pressure Coolant Injection
HVAC	Heating, Ventilation, & Air Conditioning
LCO	Limiting Condition for Operation
LPCI	Low Pressure Coolant Injection
MG	Motor Generator
MR	Maintenance Request
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
POD	Plan of the Day
QA	Quality Assurance
QC	Quality Control
RM	Radiation Monitor
SBGT	Standby Gas Treatment
SCAR	Significant Corrective Action Report
SI	Surveillance Instruction
SPOC	System Pre-Operability Checklist
SSP	Site Standard Practice
TI	Technical Instruction
TS	Technical Specification
TVA	Tennessee Valley Authority
URI	Unresolved Item
VIO	Violation
WO	Work Order
WR	Work Request